



Department of -----Biology

College of ----- Science

University of ----- Salahaddin

Subject: ----- Haematology I.

Course Book ----- (4th Year/ First semester)

Lecturer's name----- (Darya Mohammed Azeez)

Academic Year: ----- 2023/2024

Course Book

1.Course name	Practical Haematology
2. Lecturer in charge	Darya Mohammed Azeez
3. Department/ College	Biology department/ college of science
4. Contact	E-mail: darya.mohammed@su.edu.krd
5. Time (in hours) per week	Practical: 6
6. Office hours	6 hours per week
7. Course code	
8. Teacher's academic profile	<p>I graduated from salahaddin university in 2010. In Oct. 1st</p> <p>I received my M.Sc. degree in Zoology /Haematology and started teaching as Assistant lecturer in 2016.</p> <p>I have become member in Biological syndicate in 2010.</p>
9. Keywords	Hematology, blood, platelet.
10. Course overview:	
<p>Studding of this module is intended to:</p> <p>In this course students will study fundamental concepts of hematology and the analysis of laboratory results and their clinical implications.</p> <p>Understand the process of haemopoiesis and explain the function of the various blood constituents. Explain how certain disease processes may lead to a change in the numbers and morphology of blood cells.</p> <p>Understanding the principles and efficiently performing, a range of routine laboratory tests including; full blood examination (including automated analysis and manual techniques for hemoglobin estimation, hematocrit, leucocyte counts, platelet and reticulocyte counts), and erythrocyte sedimentation rate (ESR).</p> <p>Prepare, examine and report on stained peripheral blood smears (normal and abnormal) to include differential white cell count (DWCC) and assessment of morphology of blood cells. Understand the significance of the morphological changes in a peripheral blood smear and indicate further investigations useful in establishing a diagnosis of blood diseases.</p>	

Perform and understand the basis of certain laboratory tests used in the diagnosis and treatment of anemia, leukemia, and other blood disorders.

Understand normal and abnormal hemostasis, including the blood coagulation and fibrinolytic systems and the role of platelets. Perform relevant laboratory tests used in the diagnosis of patients with hemorrhagic disorders

Explain the inheritance, characteristics and nature of clinically important blood group antigens and antibodies. Understand the principles of, and perform various blood banking techniques including ABO, Rh grouping and compatibility testing.

11. Course objective

The course is especially planned for undergraduate students who intend to work in diagnostic laboratories. The goals of this module include:

1. Understanding the procedures for the collection, safe handling, and analysis of blood specimens and understanding of human blood components.
2. Demonstrate proficiency in the skills necessary to perform blood cell counts, and evaluation of blood elements within stated limits of accuracy.
3. Evaluate specimen acceptability of hematology specimens and dispose of them in the appropriate biohazard containers.
4. Evaluate laboratory test results to determine disease diagnosis.
5. Studying of different blood diseases (Anemia and Leukemia) .

12. Student's obligation

- Students should attend all lectures and not miss any lecture time.
- Electronic devices: All cell phones are to be turned off at the beginning of class and put away.
- It is highly advised not to accumulate material until before the examination time. Cramming will definitely weaken the student's ability to understand and retain valuable information.

13. Forms of teaching

- Data Show Projector
- Blackboard
- Video
- The hard copy of the lectures will be given to the students

14. Assessment scheme

Breakdown of overall practical assessment and examination

Grading System:

- Semester exams: 20 %
- Weekly quizzes: 5%

- Activities and attendance 5%
- Assignment 5%
- Overall practical haematology marks 35 %

15. Student learning outcome:

At the end of the course students should be able to

- Demonstrate a working knowledge of the theories and techniques utilized in standard laboratory procedures performed in Hematology
- Differentiate various hematological procedures and the use of basic equipment required to working in Clinical Hematology Laboratory
- Evaluate test results with normal and abnormal physiologic circumstances
- Identify the various components of blood, their functions, and roles in various disease state

16. Course Reading List and References:

- 1- Colour Atlas of Haematology Practical Microscopic and Clinical Diagnosis by Harald Thiel, Heinz Diem, and Torsten Haferlach, 2nd revised edition, 2004, Thieme Stuttgart · New York.
- 2- Diagnostic Hematology by James A. Ker, 2009, Springer-Verlag London Limited.
- 3- Hematology, Basic Principles and Practice by Ronald Hoffman, Edward J. Benz, Sanford J. Shattil, Bruce Furie et al., Copyright © 2005, Elsevier Inc.
- 4- Dacie and Lewis Practical Haematology. 2017. BARBARA J. BAIN, IMELDA BATES.
- 5- Basic Medical Laboratory Techniques. 2007. Barbara H. Estridge, Anna P. Reynolds, Norma J. Walters. 5th edition
- 6- Hematology: Clinical Principles and Applications. 2007. Bernadette F. Rodak, George A. Fritsma, Kathryn Doig. 3ed edition. Elsevier Health Sciences

17. The Topics:

Date

Week 1: Introduction to basic concepts in practical haematology lab.

4/9/ 2022

Week 2: Blood Specimen Collection.

11/9/2022

Week 3: Haematocrit test

18/9/2022

Week 4: Determination of Haemoglobin (Hb) concentration

25/9/2022

Week 5: Manual Red Blood Cell Counting.

2/10/2022

Week 6: Erythrocyte sedimentation rate

9/10/2022

Week 7: First exam

16/10/2022

Week 8: Total white blood cell counting

23/10/2022

Week 9: Preparation of the blood smear and differential Leukocyte count	30/10/2022
Week 10: anemia and RBC indices	6/11/2022
Week 11: Forward and reverse blood grouping	13/11/2022
Week 12: Crossmatch	20/11/2022
Week 13: Reticulocyte count	27/11/2022
Week 14: Second exam	4/12/2022

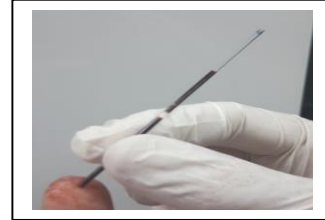
18. Examinations:

Examples of Semester Examination

Practical Hematology exam

Q1/ Write briefly the aim of using the followings in hematological tests

1. Trisodium citrate in ESR
2. Turk's solution
3. Pottassium ferricyanide in Hb determination



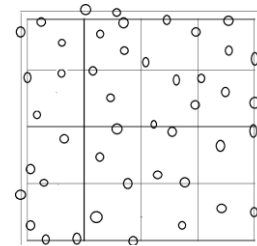
Q2/

A/ Write the name of this tube and mention the errors during this sample collection for estimation Htc

B/What are the suspected layers which are formed after centrifugation of this tube.

Q3 /

Count WBCs in this large square and calculate the number of WBC in 1 μ l of blood (if you know the sample is 10 times diluted) and explain the result?



Q4/ Explain why

- 1- The RBC pipette in some cases is used for WBC count instead of WBC pipette?
- 2- The error encountered in Hb estimation by SAHLI method may be up to 15 %? Mention two of sources error

Q5/

1. What are the differences between plasma and serum and how you can get both of them practically?
2. During blood sugar estimation blood collected in Oxalate or EDTA tubes mixed with sodium fluoride. Why?

Q6/

- 1- Why you are performing ESR? Write the principle of the test?
- 2- What are the stages of ESR?

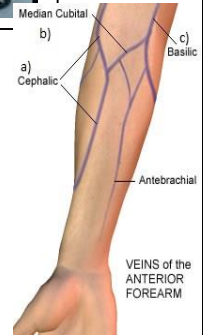
Q7/

How many platelet parameters are measured by coulter counter? What is the importance of the solution in manual PLT counting?

Q8

A/ Identify this test and briefly write the principle of it

B/ It's not true to divide PCV value by 3 for obtaining hemoglobin concentration in patients ? Why



Q9 A/ True or false

1. Polycythemia Vera is overproduction of RBC which is resulted from hypoxia?
2. Hayme's solution is used for diluting the blood during RBC counting

Q9 A/ Chose the correct answer

1. Which of the following vein is the first choice of vein puncture?

A) Cephalic vein B) Median cubital vein C) Basilic vein

2-is an anticoagulant which prevent blood clotting by inhibiting thrombin activity

a) Heparin, b) Sodium citrate, c) Salt-EDTA

Q10/

If the number of RBCs in 3 medium squares of hemomacutometer slide was 288 cell, calculate the number of RCB in 1 liter of blood?

